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sunsets following the Krakatoa outburst (whose explosion of 1883, Aug. 27, drove whole cubic miles of dust and steam, if not clear through our atmosphere, at least many times higher than the clouds ever float) indicated by their successive appearances at different places a probable upper equatorial current moving rapidly westward, i.e., rotating slower than the earth. We do not think the discussion of these red sunsets is, from this stand-point, by any means exhausted, and hope that Professor Kiessling of Hamburg, who has so well explained the physical causes of the phenomena, will publish the thousand or more records he has of the first appearances of the red sunsets all over the world. The only other occasions when these upper currents can be observed are the rare chances when the drift of a long-continuing meteor-streak might be determined from two or more observatories. If workers with equatorials would endeavor, on those rare occasions when a meteor-train remains visible, quickly to begin a series of pointings (using the lowest power) alternately upon the two ends of the streak, noting the times and reading the hour and declination-circles as rapidly as possible, we might in time accumulate some valuable data about the upper currents in our latitudes; but observatories near the equator are scarce. However, the knowledge thus gained of the heights at which meteors appear would be much more accurate than from the ordinary alignment among the stars, and these observations ought to be made on every possible occasion by astronomers.

**Two new comets.**—Two new comets have already been discovered during the present month. The first was found on Dec. 1, at Paris, the name of the discoverer not being given in the telegram. The comet was readily picked up by Professor Frisby of the Naval observatory with a 2 $\frac{3}{4}$ -inch finder, and the following observations were obtained with a 9.6-inch equatorial:—

Date.	Wash. M.T	$\alpha$	$\log p. \Delta$	$\delta$	$\log p. \Delta$
1885.					
Dec. 2	9h 20m 2s	0h 36m 11s.11	9.285	+21° 0' 20".2	0.460
" 3	8 10 56	33 53.93	8.796	20 58 46 .7	0.433
" 6	6 27 6	27 7.81	9.679 n	20 54 3 .5	0.443
" 7	6 58 54	24 50.81	8.593 n	20 52 35 .7	0.434

It has been described as ill-defined, and slightly condensed towards the centre,—without a tail. The second comet is announced in a telegram from Prof. Lewis Swift, who states that the comet was discovered by Mr. E. E. Barnard of Nashville, Tenn., on Dec. 3, its position being at 9h 37m (probably Washington mean time) R.A., 4h 21m 57s; Dec., +4° 45'. The motion is given as 35 minutes, but the direction of the motion is made unintelligible by the ambiguous term 'north west.'

In the position just given, the comet would pass the meridian a few minutes before the bright star Aldebaran, but nearly twelve degrees farther south.

#### NOTES AND NEWS.

THE work of the Henry Shaw school of botany, St. Louis, outside of the university classes, will begin with the formation of a class for the study of grasses. For the accommodation of teachers in the schools of the city, this class will meet from 9 to 1, on Saturday mornings. A class in analytical botany will take up the study of spring flowers on Tuesday and Thursday afternoons, and Saturday mornings, from April 6 till June 12, 1886.

—Those interested in composite photographs will find a plate of four of members of the National academy, in *Science* of May 8, 1885; another, from a composite photograph of several skulls, in the number for June 19; a third, of the officers of the American association at the Philadelphia meeting, in the issue of Aug. 28; and a fourth, showing the racial characteristics of Jews, in *Science* of Oct. 9.

#### LETTERS TO THE EDITOR.

\*.\* Correspondents are requested to be as brief as possible. The writers' name is in all cases required as proof of good faith.

#### Newcomb's 'Political economy.'

PROFESSOR NEWCOMB objects, in the last number of *Science*, to certain things in my recent notice of his work on political economy, charging me with 'atrocious misrepresentation' of his views. The quotation-marks enclosing two sentences in the first paragraph of my review should not have been there, and, so far as they led my readers to think that they indicated Professor Newcomb's own words, they were misleading; and an apology is due Professor Newcomb from me, which is hereby tendered. I may simply say, by way of explanation, that the proof of my article was not submitted to me in time to receive any corrections at my hands before it was printed, or the offending marks, as well as the word *always*, to which the author objects later in his letter, would certainly have been expunged.

As to the chief point at issue, however, viz., whether my article presented a correct view of Professor Newcomb's theories, I have nothing to take back or change. I have again examined Professor Newcomb's book, in connection with his strictures on my review, and do not see wherein I have misrepresented him. The point in dispute, of course, is not what Professor Newcomb desired or tried to do, nor even what he claims to have done, but simply what he actually did do in the work reviewed. It is true that he expressly disclaims any intention of doing what I maintain he has done; but this is no evidence, of course, that my view of his actual work is erroneous. The notice contained my opinion of the real work, and not of the author's

intentions. The proof of the correctness of my opinion cannot be given within the space which you can allot to the discussion, since it involves a careful comparison of Professor Newcomb's premises and conclusions, of his declared intentions and his actual success. The following sentences, taken somewhat at random from the book, seem to me to prove the general justness of my view. The italics are mine. Page 543 (Summary of principles): "The motives which animate men in the pursuit of wealth are in the highest degree beneficent, and have led to a system which insures to every man fit to live the maximum of enjoyment from his labor, if he will only adapt himself to the system." Page 518: "It is also to be remembered that the existing system insures the employment of every man in the way best suited to his talents better than any other system possibly can. This fact follows from almost the whole system of political economy, so that it need not be further dwelt upon." Pages 517 and 518: "Thus, from an idealistic point of view, nothing can be said against the general equity of the existing system of free competition." Page 516: "It is a great mistake to suppose that the enormous inequalities which we see in wealth imply any thing wrong in the system which permits them." Page 370: "We have already shown that in the state of things which now exists in this country it is scarcely possible for any industrious man to suffer for the necessities of life."

These quotations, it seems to me, present a fair view of what should be regarded as the logical outcome of the methods and principles of the book. The author is not consistent in his reasoning, and this leaves him abundant opportunity to quote passages which are at entire variance with what I represented as the result of his effort. It should also be said that they are at entire variance with the conclusions above quoted; which latter are, in my opinion, more in harmony with the general drift of the book than the former. As one interested in the progress of the science, I am glad to know that Professor Newcomb recoils with such vigor from the logical consequences of his theory, as we may hope that his influence will at last be thrown in the direction of sounder methods than those which he so vigorously repudiates and so closely follows.

In conclusion I should like to say that my objections are nearly all to the general methods and tendencies of the book. I think, as I said in essence in my review, that many of the minor discussions are admirable and suggestive. E. J. JAMES.

Professor Newcomb may well repeat the ancient prayer to be delivered from his friends, if Mr. Franklin's letter fairly represents their best efforts. With the single exception of what has been already mentioned, the latter is exceedingly unhappy in his strictures.

To begin with his last point, he remarks that the closing sentence of my review was "entirely and absurdly gratuitous, as Professor Newcomb was describing what governments do when they establish an unlimited bimetallic system." Professor Newcomb's original sentence might possibly have been excused on the ground of carelessness of statement; but if he should agree with Mr. Franklin, and still desire to stand by it in its actual form, it would simply be another instance of one of my chief objections to Professor Newcomb's general methods; viz., that he is dealing all the while with imaginary quan-

ties. It is safe to say that neither Professor Newcomb nor Mr. Franklin can adduce a single historical example where "governments, in establishing a bimetallic system, assumed that the values of equal weights of the two metals have a certain fixed ratio to each other." They have sometimes assumed that by establishing such a system they can do much toward creating such a fixed ratio, which is an entirely different thing. The statement of Professor Newcomb is doubly objectionable, — in the first place, because it is not true; and, in the second place, because it is the form usually adopted by one-sided monometallists in describing the position of bimetallics, so that they may forestall discussion by ascribing to their opponents such an absurd theory as to make them appear a pack of drivelling idiots. I prefer to think that Professor Newcomb does not desire to bolster up his position by any such questionable devices.

Mr. Franklin asks how much of the influence of recent German writers on economic science is traceable in Professor Sidgwick's book. The mere question proves one or both of two things: 1°, that Mr. Franklin is only superficially acquainted with Professor Sidgwick's work; or, 2°, that he knows nothing of recent German writers on political economy; or, 3°, both. The influence of German thought is evident on nearly every page — certainly in every chapter — of Professor Sidgwick's book. Some of the chapters, indeed, — notably the one on public finance and that on distributive justice, — might almost be called abstracts of Wagner. I did not say that Professor Newcomb knows nothing of recent political economy, but simply that his treatment of the subject shows no traces of such knowledge. To give evidence of such knowledge, it is not necessary, of course, to quote from recent works. One might reveal the fact in one's methods and conclusions that the gigantic movements of the last generation had not swept by without in some degree affecting the views of the writer. A man who writes a work on physics need not stop to trace out the authority for each statement he makes in order to show that he is abreast of the time. To do that would be as absurd in form as it would be in reality, if he attempted to write such a book without taking any notice of the work done in that department within the last generation.

Whether it be evidence of ignorance and incompetence in any field to adhere to the system of a past generation when another system, whatever may be its merits or defects, has certainly displaced the old one, may fairly enough be left to the sober sense of men of science and to the practical answer of a moving world. It seems pretty clear that Mr. Mill, to whose methods and system Mr. Franklin implies that Professor Newcomb adheres, would indignantly repudiate any such views as those above quoted from Professor Newcomb's book, since he regarded them as already obsolete at the time when he wrote.

I did not say, nor did I mean to imply, that Professor Newcomb had just begun to make excursions into the economic field, but that these excursions had always been of a hasty and desultory character, since the better part of his life and effort had been devoted to something else; and, further, that the whole tenor of his introduction was that we should now see an example of the true scientific method, the failure to apply which, so far, was the real secret of the failure of political economy. E. J. J.